

# NACE International Standards & DoD Corrosion Prevention/Control Effort

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March 9, 2005

# NACE International

- Presentation Outline
- NACE Overview
- NACE Standards
  - Standards Development
- Cost of Corrosion
- DoD Corrosion Effort
- DoD Specification, Standards, and Qualification Process Working Integrated Product Team

# NACE International

## History

- Founded in 1943
- Began with the Oil & Gas Industry

Since 1943 NACE has:

- Produced over 100 standards
- Developed numerous training and certification programs
- Grown to over 15,000 members worldwide

# NACE MISSION

**To protect people, assets, and the environment from the effects of corrosion.**

# NACE International

- Industry Represented
  - Oil & Gas (production, distribution, storage, refining & processing)
  - Infrastructure
  - Pipeline & Underground Storage
  - Waste Management
  - Power & Utilities
  - Government

# NACE International

- Over 15,000 Professionals from 91 countries
- Individual Members Representing:
  - Engineers
  - Inspectors
  - Scientists
  - Researchers
  - Educators
  - Students
  - Technicians
  - Manager
  - Supervisor

# NACE Resources

- NACE Standards
- Education Programs
- Professional Recognition
- Coating Inspector Training
- Cathodic Protection Certification
- Annual Conference
- NACE Periodicals

# NACE Certification & Training

## Education Programs

- NACE offers education courses for members and non-members worldwide. General Education Courses include:
  - Basic Corrosion
  - Corrosion in Oil & Gas Production
  - Protective Coatings & Linings
  - Designing for Corrosion Control
  - Microbiologically Influenced Corrosion

# NACE Certification & Training

## Areas of Certification

- Corrosion Specialist
- Corrosion Specialist, P
- Corrosion Specialist, G
- Specialty Area Certification
  - Coating Inspector Certification\*\*
  - Cathodic Protection Specialist\*\*
  - Chemicals Treatment Specialist
  - Materials Selection/Design Specialist
  - Protective Coatings Specialist
- Senior Corrosion Technologist
- Corrosion Technologist
- Corrosion Technician
- Internal Corrosion Technologies

# NACE Certification & Training

## Coating Inspector Program

- It was developed to meet worldwide industry needs for a recognized needs for a recognized standard for coating inspectors training and for improved coating applications inspection.
- More than 3,600 people worldwide are recognized at different levels of coating inspector training.

# NACE Certification & Training

- NACE CP is the leading training & certification tool for industry
- CP is a 4 level hands-on Program
  - Level 1 - Tester
  - Level 2 - Technician
  - Level 3 - Technologist
  - Level 4 - Specialist

# NACE Conferences

## Annual Conference

- 6,000 corrosion professionals from 56 countries and more than 350 exhibiting companies attend the NACE annual conference. Each year there are approx.
- 35-40 technical symposia, and approx. 400 technical papers presented. In addition to the annual conference NACE produces many other regional conferences during the course of the year.

# NACE Publications

## NACE Periodicals

- *Materials Performance* - A monthly journal of practical corrosion control applications and case histories for solving corrosion-related problems affecting all industries.
- *Corrosion - The Journal of Science & Engineering*
  - A monthly technical research journal devoted to critically evaluating the causes and effects of corrosion processes, and the protection of materials in corrosive environments

# NACE Standards

- NACE International's Technical Coordinating Committee (TCC) oversees more than 350 technical committees that research, study, and recommend state-of-the-art corrosion technology to industry and government. NACE International's committees produce consensus industry standards in the form
  - Test Methods
  - Recommended Practices
  - Material Requirements
- NACE standards are used worldwide.

# Corrosion

- Corrosion is an asset preservation matter, and not just a maintenance issue.

# NACE Standards Development Procedures

# NACE ANSI-Accredited Standards Developer

- Procedures Approved by American National Standards Institute (ANSI)
- ANSI is U.S. member of International Organization for Standardization (ISO)
- In ISO, one country, one vote

# ANSI Procedures

- NACE submits standards to ANSI for approval
- ANSI solicits public comments
- NACE must address any comments, and must prove that proper process was followed

# Technical Committee Organization

## Specific Technology Groups (STGs)

- 30 STGs on topics from aviation to oil and gas pipelines form voting groups
- STGs have 80 to 300 members
- Nonmembers may also vote on standards by contacting NACE Headquarters

# NACE Standards Development

- Task Groups
  - Write documents, e.g., standards, reports
    - Reports cannot make recommendations
  - Formed when need for standard identified

# NACE International - Review

Forum for technology

- Symposia,  
Seminars
- Administer Tri-  
Services  
Conference 2005  
Orlando, FL

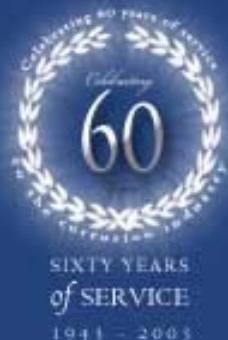
Internationally  
Recognized Technical  
Standards

- Consensus  
technology
- ANSI

- Periodicals and Books
  - Corrosion Journal
  - Materials Performance
  - DoD eNewsletter (Sept 2005)
- Education & Certification
  - Tech. through Engineer
- Public Affairs
  - Government Relations
  - Public Awareness
  - Corporate outreach

# \$276 Billion

The United States Cost of Corrosion Study



**NACE<sup>®</sup>**  
INTERNATIONAL  
THE CORROSION SOCIETY









## **Hawaii (1988) : Aloha Airlines Boeing 737**

- At 25,000 ft., lost part of front fuselage
- Stewardess sucked out of jet
- Pilot miraculously lands jet in Maui
- CAUSE: CORROSION
- Over 2,500 commercial planes now flying beyond their designed lifespan



**Washington, DC (November, 1999)**

**US Army Apache Helicopters Grounded**

- Faulty part in tail rotor assembly results in helicopter crash
- CAUSE: STRESS CORROSION FRACTURE
- All helicopters grounded until parts replaced



# **Cost of Corrosion - Industry Sector Analysis**

26 Sectors in 5 Categories

- Infrastructure
- Utilities
- Transportation
- Production & Manufacturing
- Government

# COC - Non-Technical Preventive Strategies

Increase awareness of the large corrosion costs and potential savings

- Change the misconception that nothing can be done about corrosion
- Change policies, regulations, standards, and management practices to increase corrosion savings
- Improve education and training of staff

# COC - Technical Preventive Strategies

- Advance design practices for better corrosion management
- Advance life prediction and performance assessment methods
- Advance corrosion technology through research, development, and implementation

# Cost of Corrosion - Summary of Sector Analyses

Infrastructure	B\$	22.6
Utilities	B\$	47.9
Transportation	B\$	29.7
Production & Manufacturing	B\$	17.6
<b>Government</b>	<b>B\$</b>	<b>20.1</b>
<b>TOTAL</b>	<b>B\$</b>	<b>137.9</b>



<b>Defense</b>	B\$	<b>20.0</b>
<b>Nuclear Waste Storage</b>	B\$	<b>0.1</b>
<b>TOTAL</b>	<b>B\$</b>	<b>20.1</b>



- The U.S. Congress recently approved \$27.1M for the Department of Defense Corrosion Effort in FY2005
- NACE is working with the U.S. Department of Defense to develop and implement a comprehensive corrosion mitigation program

# NACE & the Department of Defense

# Congressional Direction

***Public Law 107-314 Sec: 1067. Prevention and mitigation of corrosion of military infrastructure and equipment requires that:***

**DoD designate a responsible official or organization  
DoD develop a long-term corrosion strategy to include**

- **Expansion of emphasis on corrosion prevention & mitigation**
- **Uniform application of requirements and criteria for the testing and certification of new corrosion prevention technologies within common materiel, infrastructure, or operational groupings**
- **Implementation of programs to collect and share information on corrosion within the DoD**
- **Establishment of a coordinated R&D program with transition plans**

# Department of Defense

- DoD creates the Directorate of Corrosion Policy & Oversight
- A key element of this effort is to provide adequate training and certification for service personnel
- DoD works with NACE to develop a series of corrosion training & certification programs

# DoD & NACE

- DoD contacted NACE in January 2003 for assistance in addressing this issue
- NACE is working to provide a number of resources for DoD
  - Corrosion 101 Course (the first of three courses)
  - E-newsletter
  - Facilities training and certification
  - Tri-Services Corrosion Conference (Orlando, FL. November 2005)
  - Standards

# DoD Spec & Standards WIPT

- The Working Integrated Product Team has been reviewing all military standards and comparing to industry
- Working with NACE to begin to address the corrosion related standards
- Looking to use industry standards where applicable and develop or refine current military specific standards

# DoD Spec & Standards WIPT

- NACE has a STG that is working with the military to begin strengthening the needed standards
- DoD has asked NACE to coordinate with other technical societies that develop corrosion related standards to ensure that they have the most accurate standards

# DoD Spec & Standards WIPT

Questions?